WHAT IS CLAIMED IS:

1. An electro-optical glazing structure having scattering and transmission modes of operation for selectively scattering and transmitting electromagnetic radiation, respectively, said electro-optical glazing structure comprising:

an electro-optical glazing panel of laminated construction, having first and second optical states of operation; and

optical state switching means for switching said electro-optical glazing panel to said first optical state of operation in order to induce said electro-optical glazing structure into said scattering mode of operation, and for switching said electro-optical glazing panel to said second optical state of operation in order to induce said electro-optical glazing structure into said transmission mode of operation.

2. An electro-optical glazing structure which has total-scattering and total-transmission modes of operation for improved control over the flow of electromagnetic radiation within the solar region of the electromagnetic spectrum.

3. The electro-optical glazing structure of claim 2, in which the modes of operation can be electrically-activated or switched, while avoiding the use of energy absorbing mechanisms.

4. The electro-optical glazing structure of claim 2 which has a broad band of operation, including the near-IR, visible and near-UV portions of the electromagnetic spectrum.

5. An actively-controlled window or viewing panel constructed from the electro-optical glazing structure, wherein the transmission of electromagnetic radiation over the near-UV and near-IR regions of the electromagnetic spectrum can be totally scattered, rather than absorbed, reducing the temperature cycle range which the window structure is required to undergo.

6. An actively-controlled window or viewing panel employing an electro-optical glazing structure fabricated from a polymer stabilized cholesteric texture (PSCT) that uses low cost liquid crystal materials.

7. An electro-optical glazing structure having uniform optical characteristics and is constructed using low-cost PSCT polymer materials.

8. A PSCT-based electro-optical glazing structure that uses a polymer which does not have the liquid crystalline phase, i.e. the polymer does not have the mesogenic group.

9. A PSCT-based electro-optical glazing structure that uses dichroic dyes in a low cost PSCT material.

10. A PSCT-based electro-optical glazing structure that can be switched using relatively lower voltages than that required by prior art devices.

11. A PSCT-based electro-optical glazing structure that has improved mechanical strength.

12. A PSCT-based electro-optical glazing structure that uses low cost glass substrates.

13. A PSCT-based electro-optical glazing structure that uses low cost glass substrates with insulating layers.

14. A PSCT-based electro-optical glazing structure made using a special additive which eliminates liquid crystal flow streaks.

15. A PSCT-based electro-optical glazing structure which is made using a low cost conductive layer as electrode surfaces on the glass substrates thereof.

16. A system for fabricating a PSCT-based electro-optical glazing structure manufacture process in a way which enables the manufacture of low-cost PSCT-based devices having surface areas greater than 2 meters x 3 meters.

17. A system for making PSCT-based electro-optical glazing structures which are haze-free, defect-free, and have uniform optical characteristics over the surface area of the device.

18. A system for making PSCT-based electro-optical glazing structures using inexpensive liquid crystal material which does not

have the liquid crystalline phase (i.e. the polymer does not have the mesogenic group).

19. A system for making PSCT-based electro-optical glazing structures which utilizes float-glass fabrication techniques.

20. A system for making PSCT-based electro-optical glazing structures which involves the addition of a surfactant in order to achieve uniform optical properties across the entire surface of the electro-optical glazing structure.

21. A method of fabricating a PSCT-based electro-optical glazing structure manufacture process in a way which enables the manufacture of low-cost PSCT-based devices having surface areas greater than 2 meters x 3 meters.

22. A method of making PSCT-based electro-optical glazing structures which are haze-free, defect-free, and have uniform optical characteristics over the surface area of the device.

23. A method of making PSCT-based electro-optical glazing structures using inexpensive liquid crystal material which does not have the liquid crystalline phase (i.e. the polymer does not have the mesogenic group).

24. A system for making PSCT-based electro-optical glazing structures which utilizes float-glass fabrication techniques.

25. A system for making low-cost PSCT-based electro-optical glazing structures which involves the addition of a surfactant in order to achieve uniform optical properties across the entire surface of the electro-optical glazing structure.

26. An intelligent window system for installation within a house or office building, or aboard a transportation vehicle such as an airplane or automobile, wherein the electro-optical glazing structure of the present invention is supported within a prefabricated window frame, within which are mounted: a electromagnetic-sensor for sensing electromagnetic conditions in the outside environment; a battery supply for providing electrical power; a electromagnetic-powered battery recharger for recharging the battery; electrical circuitry for producing glazing control voltages for driving the electrically-active elements of the electro-optical glazing supported within the window frame; and a micro-computer chip for controlling the operation of the battery recharger and electrical circuitry and the production of glazing control voltages as required by a radiation flow control program stored within the programmed microcontroller.

27. An electro-optical window structure which is designed for integration within the heating/cooling system of a house, office building, factory or vehicle in order to control the flow of broad-band electromagnetic radiation through the electro-optical window structure, while minimizing thermal loading upon the heating/cooling system thereof.

28. A thermal/viewing shield or panel made from electro-optical glazing structure of the present invention.

29. An intelligent pair of sunglasses, in which each optical element is realized using an electro-optical glazing structure of the present invention, fashioned to the dimensions of a sunglass frame.

30. An intelligent pair of shutter glasses, in which each optical element is realized using an electro-optical glazing structure of the present invention, fashioned to the dimensions of a shutter glass frame.

31. An intelligent windshield or viewing screen, which is realized from an electro-optical glazing structure of the present invention.

add 32